

MEDICINAL SUBSTANCES
OF ANIMAL ORIGIN



WILLIAM HUNTER, M.D., F.R.S.

Anatomist and Gynæcologist, closely
associated with the early histories
of the Middlesex and the British
Lying-in Hospitals

BURROUGHS WELLCOME & CO.

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WILLIAM HUNTER

1718-1783

William Hunter was the elder brother of John Hunter, the famous surgeon. He gained outstanding renown in London as an anatomist, surgeon and lecturer. Success in obstetric practice led him to abandon surgery. He was elected Surgeon-Accoucheur to the Middlesex Hospital in 1748 and to the British Lying-in-Hospital in 1749. Becoming the leading London obstetrician, he was consulted in 1762 by Queen Charlotte, to whom he was appointed Physician-Extraordinary in 1764. He built a lecture theatre, dissecting room and large anatomical and pathological museum in Great Windmill Street. The Museum was, in 1770, removed to Jermyn Street.



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MEDICINAL SUBSTANCES OF ANIMAL ORIGIN

INTRODUCTION

PREVIOUS to 1889, when Brown-Séquard published his well-known work, the use of animal substances in medicine, although probably as old as the healing art itself, was entirely empirical. Knowledge of the endocrine system has since increased enormously and the function of many ductless glands is now known.

Important developments have been the isolation of active principles from certain of the glands such as the medulla of the suprarenal body, posterior lobe of pituitary and the islands of Langerhans of the pancreas. Such active principles have been found to possess definite physiological activity and have become, therefore, of great clinical importance.

Active
principles
isolated

It is recognised that the physiological activity or clinical value of preparations of some of the dried endocrine glands or other tissues mentioned in the

latter part of this book is not of the same definite character as that of, for example, thyroid gland. It is important that exaggerated claims—founded on insecure clinical observation and without physiological support—should not be made for this type of preparation.

A system of grouping adopted by Burroughs Wellcome & Co. enables an estimate to be made of the potential therapeutic efficiency of any gland substance or combination. This system of grouping is preserved in the chapters of this book.

CHAPTER 1.—In this are included those glandular products concerning the therapeutic value of which there is ample and indubitable evidence—physiological as well as clinical. The internal secretions produced in these glands can be presented in preparations capable of producing quantitatively demonstrable effects when administered to the human subject or to animals.

The thyroid, pituitary posterior lobe ('Infundin'), pancreas (Insulin) and suprarenal medulla (Adrenalin) answer these requirements.

Liver extract has been found specific in the treatment of pernicious anæmia.

CHAPTER 2.—Here are discussed those glands, transplantation, removal or disease of which produces profound metabolic changes referable to the absence of a hormone, but for which the physiological and clinical evidence for substitution therapy is conflicting. The substances concerned include the parathyroid orally administered, ovary, testes,

anterior lobe of pituitary and cortex of suprarenal. Of these, the ovary, anterior lobe of pituitary, cortex of suprarenal and parathyroid yield extracts which produce physiological effects on injection subcutaneously into animals, but the first three are not yet available in a suitable form for use in man.

There is a certain amount of conflicting evidence that administration by mouth produces results in man, but with the exception of parathyroid no effect has been demonstrated when these extracts are administered by mouth to animals.

The justification for the clinical trial of the substances enumerated in this chapter is that many physicians are convinced, from results obtained in their own practice, that the administration favourably influences certain diseases. It is obvious that in our present state of knowledge the only hope of such clinical results lies in the administration of the whole gland substance, as in 'TABLOID' products.

CHAPTER 3.—Deals with substances such as spleen, thymus, brain, renal substance, mammary, lymphatic and prostate gland substance. These give little or no laboratory evidence of the existence of an internal secretion, and clinical evidence is more uncertain than that relating to the substances in Chapter 2.

CHAPTER 4.—Deals with products in which are combined more than one animal substance. The use of such products, combining as they do, ingredients of established therapeutic effect with others concerning which the evidence is obscure, is naturally experimental. Certainty, one way or another, can be established only when all elements of doubt have been eliminated in regard to the authenticity, purity and accuracy of the material employed. For this reason, the use of 'TABLOID' products is recommended.

DEVELOPMENT OF ORGANO-THERAPY

Of late years it has been more and more clearly recognised by physiologists and clinicians that the endocrine system does not consist of a series of isolated, independently-acting units, but that the endocrine organs are members of a commonwealth, each dependent on, influenced by and exerting influence upon, the others.

Another important development has been the realisation that such comparatively rare diseases as myxœdema, acromegaly, etc., are only what

may be called the spectacular results of an extreme degree of endocrine disorder, and that many much less severe and often obscure and ill-defined conditions of ill-health are due to minor degrees of disturbed endocrine functioning.

POLICY AND METHODS OF BURROUGHS WELLCOME & CO.

The provision of the necessary materials, either for accepted treatment or for clinical trial, is the sphere of the manufacturing pharmaceutical chemist, whose duty it is to present them in the highest degree of purity, activity and convenience, without making exaggerated claims in regard to their therapeutic effects. Whether they should be used and for what purposes are matters for the physician's decision.

Except where there is definite knowledge which justifies the issue of an extract, as in the case of 'Infundin' Pituitary (Posterior Lobe) Extract, Burroughs Wellcome & Co. present, for the use of the medical profession, 'Tabloid' Animal Substances which represent the natural whole gland substances, desiccated and compressed for convenience of administration, but with such care that nothing is eliminated but water.

The use of solvents may expedite and cheapen production, but, in the present state of knowledge, this is dangerous because there is no certainty that valuable, or even essential, principles may not be dissolved as well as fat and other non-essentials. Solvents are not used by Burroughs Wellcome & Co. in the preparation of whole gland substances.

To ensure that only fresh, normal glands are employed, all material intended for use in the preparation of 'TABLOID' ANIMAL SUBSTANCES is, before desiccation, examined by trained workers, who reject any abnormal material. Where necessary, as in the case of parathyroid gland, microscopic examination is used to ensure that only the *true* substance is employed.

DOSAGE IN TERMS OF FRESH GLAND SUBSTANCE

In harmony with their determination to present the whole gland substance with its natural principles unimpaired, Burroughs Wellcome & Co. state the strengths of 'TABLOID' products *in terms of the whole gland substance.*

Thus, 'Tabloid' Thyroid Gland, gr. 5, represents five grains of fresh gland substance, *and not five grains of desiccated thyroid.*

There is no standard for dehydration, which may be partial or absolute, but the standard fixed in terms of the fresh gland substance is not capable of misinterpretation.

ADVANTAGES OF 'TABLOID' ANIMAL SUBSTANCES

To summarise the advantages of 'TABLOID' ANIMAL SUBSTANCES:—

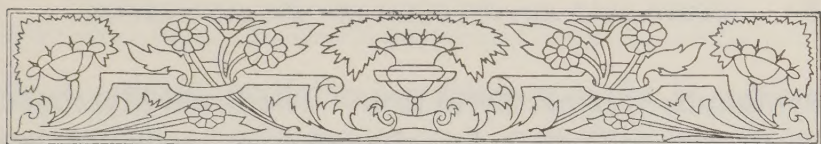
They represent the *whole* of the natural gland substances whose names they bear.

The removal of adventitious tissue is effected by skilled dissection, not by solvents.

Desiccation and compression are carried out with the least possible risk to the therapeutic activities of the fresh glands.

The strength of each product is stated so as to show precisely how much natural substance it represents.

SPECIAL NOTICE.—Material obtained exclusively from freshly-killed animals is used by Burroughs Wellcome & Co. in the preparation of 'TABLOID' organo-therapy products



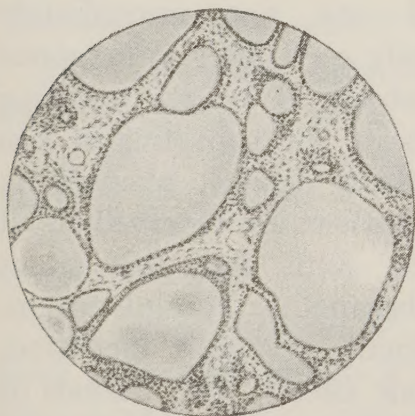
CHAPTER 1

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THYROID GLAND

THE thyroid gland elaborates an internal secretion possessing fundamental importance as the accelerator of cell processes, and the determinant of the level of catabolic activity in the body. It contains thyroxine, a complex organic compound containing iodine, which possesses the characteristic action of thyroid gland on oral administration. Deficiency in the internal secretion of the thyroid results in a lowering of metabolic activity to a level incompatible with

Deficiency
and
excess



Section of THYROID GLAND

either normal physical and mental development (cretinism) or with the continued normal functioning of the adult organism (myxœdema). Excess results in heightened catabolic level (increase in Basal Metabolic Rate), with increase in destruction of proteins and carbohydrates, loss of body-

fat, a heightened response of the sympathetic system to adrenalin, increased heat production, increased gas exchange, together with the clinical

symptoms of hyperthyroidism. The Basal Metabolic Rate, as indicated by the oxygen consumption in given time, is a measure of thyroid activity and varies less than 10 per cent. normally, but in hyperthyroidism the rate is increased 20 to 50 per cent. or more above normal, and in thyroid deficiency is reduced similarly below normal. The active principle is absorbed from the alimentary tract, and a deficiency is made good or an excess established by oral administration of dried gland or active principle (thyroxine). One milligramme of thyroxine, orally, raises the Basal Metabolic Rate about 2 per cent. at the height of its action. A certain balance appears to exist in the functional activities of certain endocrine glands (*e.g.*, thyroid, suprarenal medulla and posterior pituitary), and disturbances of the thyroid are often associated with a general imbalance and with the clinical signs of disturbances in other endocrine glands.

The effects of the administration of a single dose of dried thyroid are not immediately apparent and develop slowly even after intravenous injection—beginning in about 24 hours, reaching a maximum in 7 to 10 days, and subsiding in 7 to 10 days more. In excessive dosage, phenomena of hyperthyroidism are observed about the fifth or sixth day—this latent period is important in therapeutic administration. Initial doses should be small, gradually increased, and adjusted to avoid toxic effects, with periods of intermittence (administration may be discontinued one week in four). The first dose may be 'TABLOID' THYROID GLAND, gr. 1, three times a day, increased by a like amount every week, according to the degree of hypothyroidism; after full therapeutic effect has

Dosage

been gained, maintenance doses may be bi-weekly or weekly. Early evidence of over-dosage may be noted in slight diarrhoea, tachycardia, increase in nervous excitability and loss of weight.

The dosage of 'Tabloid' Thyroid Gland products is stated in terms of fresh gland and not dried gland (4:1). Thus, 'Tabloid' Thyroid Gland, gr. 1, is the equivalent of dried gland, gr. $1/4$.

INDICATIONS

Thyroid Gland is used to replace or supplement the normal thyroid secretion when this is lacking in cretinism and backward development in children; and in myxœdema and the lesser degrees of sub-thyroidism in the adult.

Treatment with thyroid gland should also be considered in the following conditions: simple goitre, obesity, amenorrhœa, dysmenorrhœa, toxæmias of pregnancy, mental disorders, skin affections, nocturnal incontinence, rheumatoid arthritis and fibrositis, senility and at the menopause.

For therapeutic purposes, a preparation of the dried gland as a whole, such as is presented in 'Tabloid' Thyroid Gland, is by far the most reliable medium to employ.

CRETINISM

The administration of thyroid gland produces most remarkable results if given in the early stages. The stunted growth, low, broad forehead, flat nose, widely-separated eyes, stolid expression and muddy skin are all changed; active growth of the long bones begins, the facial expression becomes normal and the mental condition brightens. Since, however,

the ingested thyroid acts as a substitute for the deficient normal secretion, the patient must continue the use of thyroid gland in small doses throughout life. The earlier treatment is commenced the better the results will be. The patient may begin with gr. 1/10, thrice daily, gradually increased up to 20 or 30 grains a day. The dose is then diminished gradually until the minimal amount maintaining a beneficial result is determined.

MYXŒDEMA

Myxœdema is a chronic disease of gradual onset and somewhat obscure ætiology, dependent upon an atrophy of the thyroid gland. In most cases it shows itself in a gradual drying and thickening of the skin, beginning on the face, and continuing till the hands and feet and the whole body present a bloated appearance; obesity, nervous disorders, tetany, mental disturbances and atrophic degeneration of the skin and epidermal appendages (nails, hair, teeth) are also present. Languor, extreme sensitiveness to cold, mental dullness, drowsiness and thick and drawling speech are characteristic, the latter being due to enlargement of the tongue.

In nearly every case, these symptoms yield rapidly and completely to treatment with thyroid gland. In myxœdema, as in cretinism, administration in small doses must be continued indefinitely.

Small doses are given at first; for instance, gr. 1, thrice daily, and gradually increased. The dosage is then decreased until the minimal dose producing the best result is established.

An interesting description has been published of the first case of myxœdema ever treated with

thyroid gland.* The patient had taken thyroid for 28 years, and enjoyed excellent health up to the time of her death, which was due to cardiac failure.

SUB-MYXŒDEMA (SUB-THYROIDISM)

A condition due to a minor degree of hypothyroidism, and characterised by symptoms similar to, but less pronounced than, those of myxœdema, is now generally recognised, and frequently designated by the name of sub-myxœdema or sub-thyroidism.

Sub-thyroidism in the adult is indicated by one or more of an indefinite group of symptoms, such as subnormal temperature, tendency to obesity, dry skin, deficiency of outer third of eyebrows, occipital headaches, pain in limbs, rheumatoid or fibrositic tendency, pruritus, amenorrhœa, delayed menstruation, premature senile changes, somnolence, rapid fatigue and asthenia. A slight degree of hypothyroidism may become accentuated during gestation or lactation. Such sub-myxœdematous cases are treated by administration of thyroid gland.

BACKWARD DEVELOPMENT

Delayed or arrested development, physical and mental, in children, is frequently associated with a greater or less degree of hypofunction of the thyroid. Such cases show symptoms similar to those of sub-myxœdema, and, in addition, impairment of growth, protuberant abdomen, lumbar lordosis, and developmental abnormalities (undescended testicles, umbilical hernia, etc.) may be present. Later, there is delayed sexual development, with immature sexual organs, stunted stature, and backward mental development. Such cases improve notably under

* *British Medical Journal*, March 13, 1920

thyroid medication. Dosage and method of treatment is similar to that used in Cretinism (*see page 9*).

SIMPLE GOITRE

Administration of thyroid gland has been found useful in some cases of simple goitre. In exophthalmic goitre it is contra-indicated.

GENITAL DISORDERS

Some cases of sterility, infantilism and "sexual neurasthenia" appear to be largely due to thyroid insufficiency, and may be relieved by administration of thyroid gland.

OBESITY

When obesity occurs in women at the time of the menopause, or in adiposis dolorosa, rapid loss of weight and general improvement in bodily condition often follow the administration of thyroid gland. In all cases of obesity, a careful examination should be made for signs of hypothyroidism.

TOXÆMIAS OF PREGNANCY

In normal pregnancies the thyroid gland becomes enlarged. It has been suggested that such conditions as albuminuria, vomiting of pregnancy, etc., are due to auto-intoxication by substances which should normally be counteracted by an increased thyroid secretion. In such cases the administration of thyroid gland has been found useful.

MENTAL DISORDERS

Thyroid gland has been found useful in insanity occurring during adolescence, the puerperium and the climacteric. It is contra-indicated in mania with acute excitement and rapid loss of weight.

In many of the cases in which dementia præcox develops at puberty, improvement can be obtained by means of thyroid therapy.

SKIN AFFECTIONS

Thyroid gland has caused improvement in some cases of psoriasis, chronic eczema, ichthyosis and lupus.

NOCTURNAL INCONTINENCE

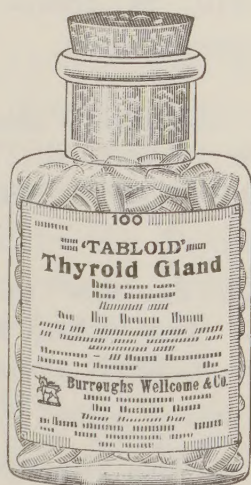
It has been pointed out that, while thyroid deficiency is not present in every case of nocturnal incontinence (enuresis), it is found in a great many instances. Such inadequacy leads to under-nutrition of the bladder walls; the latter desquamate rapidly and so become unduly sensitive to stimuli; consequently, frequency of micturition and enuresis generally follow. In such cases thyroid gland has been used with striking success.

RHEUMATOID AND FIBROSITIC CONDITIONS

Good results have been obtained from thyroid treatment in rheumatoid arthritis and in the fibrositic diathesis (lumbago, sciatica, etc.).

AMENORRHOEA AND DYSMENORRHOEA

In view of the stimulating action of the thyroid secretion upon the menstrual function, the administration of thyroid gland, alone, or with ovarian substance (see 'TABLOID' MIXED GLANDS, page 35), has been found useful in amenorrhœa and in dysmenorrhœa; also in the delayed onset of menstruation at puberty.



Reduced facsimile

THE MENOPAUSE

The symptoms of the menopause may be considered as a functional disturbance of the endocrine system dependent upon the withdrawal of the ovarian secretion. The symptoms may be chiefly referred to vasomotor changes. In spite of the hypothesis that there is a relative hyperthyroidism, the administration of thyroid gland is one of the most effective measures for the relief of the symptoms of the menopause.

SENILITY

Thyroid has been found valuable in premature senile changes and hypochondriasis (*see also* 'TABLOID' MIXED GLANDS, *page 35*).

Standardisation.—'TABLOID' THYROID GLAND is standardised by chemical means so as to ensure that each product represents the stated amount of the fresh healthy gland substance containing 0.08 per cent. of Iodine, corresponding to 0.32 per cent. of Iodine in the dried gland, in organic combination.

Attention is drawn to the wide range of dosage provided by 'TABLOID' THYROID GLAND, which is supplied in accurate doses ranging from gr. 1/10 up to gr. 5.

Preparations

TRADE MARK 'TABLOID' BRAND THYROID GLAND (*Standardised*),
gr. 1/10 (0.0065 gm.); gr. 1/4 (0.016 gm.); gr. 1/2 (0.032 gm.); gr. 1 (0.065 gm.); gr. 1-1/2 (0.097 gm.); gr. 2 (0.13 gm.); gr. 2-1/2 (0.162 gm.); gr. 5 (0.324 gm.); 0.05 gramme*; 0.1 gramme*; and 0.3 gramme* [B. W. & Co.]

* Obtainable in the British Empire Overseas to special order only

'Tabloid' Thyroid Gland is standardised to contain 0.32 per cent. of iodine in the desiccated gland substance.

DIRECTION.—Small doses should be given at first; one grain three times a day, increasing the dose with caution according to the effect produced. For children, the commencing dose may be gr. 1/4, three times a day.

Each strength in bottles of 100

TRADE MARK 'TABLOID' BRAND THREE GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

TRADE MARK 'TABLOID' BRAND MIXED GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

THYROXINE

'TABLOID' BRAND THYROXINE is prepared synthetically by the process of Harington and Barger and agrees physiologically and clinically with the earlier natural thyroxine isolated from the thyroid gland by Kendall. It possesses the characteristic action of thyroid gland on oral administration and has the same therapeutic indications.

Preparations

TRADE MARK 'TABLOID' BRAND THYROXINE, 0.0001 gramme; and 0.001 gramme [B. W. & Co.]

DIRECTION.—One to five, gradually increased, of the 0.0001 gramme strength, or one of the 0.001 gramme strength, three times a day.

Each strength in bottles of 100

INSULIN

'WELLCOME' BRAND INSULIN conforms to the Therapeutic Substances Act (Great Britain), 1925. Every batch is biologically standardised at The Wellcome Physiological Research Laboratories. The method employed is approved by the British Medical Research Council, under whose licence 'WELLCOME' BRAND INSULIN is made and to whom a sample of each batch is submitted, together with the relative potency and sterility reports, and no batch is issued until the Council's certificate of approval is obtained.

'Wellcome' Brand Insulin not only meets the legal standards but the Insulin Hydrochloride used in its preparation has to conform to a standard of purity set by Burroughs Wellcome & Co. This standard has gradually been raised as methods of preparation have been improved and the standard now adopted approaches that of the purest Insulin ever obtained even by research workers.



Section of Pancreas showing an Island of Langerhans

Preparations

TRADE MARK 'WELLCOME' BRAND INSULIN, 100 International units in 5 c.c.; 200 International units in 10 c.c.; and 200 International units in 5 c.c. [SEE LIST B. W. & Co.]

DIRECTION.—Ten units, or more, by hypodermic injection.

Rubber-capped amber glass phials

TRADE MARK 'TABLOID' BRAND HYPODERMIC INSULIN HYDROCHLORIDE (10 units), *sterile* [SEE LIST B. W. & Co.]

Each dose may be prepared in the syringe barrel as required; solution takes place immediately. There is no loss of solution, and risk of contamination is obviated. The products are sterile, stable and accurate in dosage, and their portability is convenient. They enable solutions to be prepared of any desired concentration.

DIRECTION.—One, or more, dissolved in syringe and administered hypodermically.

Issued in two packings:—

No. 150.—Cartons containing 10 products in ONE tube.

No. 152.—Cartons of 10 tubes, each containing ONE product.

The only British Insulin issued as a compressed product

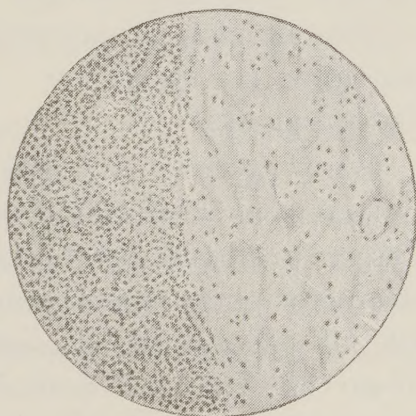
TRADE MARK 'INFUNDIN' BRAND
PITUITARY (POSTERIOR LOBE) EXTRACT
AND

TRADE MARK 'NEO-INFUNDIN' BRAND
OXYTOMIC PRINCIPLE OF THE PITUITARY
POSTERIOR LOBE

'INFUNDIN' is a stable liquid extract prepared from the carefully separated posterior lobe of the pituitary body. 'INFUNDIN' and 'NEO-INFUNDIN' comply with the requirements of the Therapeutic Substances Act (Great Britain), 1925. The activity of 'INFUNDIN' and 'NEO-INFUNDIN' is stated in terms of International Units.

ACTION

The extract of the posterior lobe of the pituitary body ('Infundin') contains two chief active principles, namely, one having an oxytomic property (power to stimulate the musculature of the uterus) and the other a pressor principle causing an increase of blood-pressure by contracting the musculature of the blood vessels; the pressor fraction also causes contraction of the bladder and intestines and other smooth muscle (by direct action on the muscle). The diuretic-antidiuretic action also resides in the pressor fraction (deficient in diabetes insipidus).



Anterior Posterior
Section of PITUITARY BODY
Posterior and Anterior Lobes

The uterus is powerfully stimulated during labour or the puerperium; the type of uterine contraction brought about is not a long-sustained spasm, as with ergotoxine, but consists of a marked increase

in the rate, amplitude and strength of the normal rhythmical contractions present during labour, the effect being short-lived (about half-an-hour). The blood-pressure is raised and maintained for a much longer period than by adrenalin, but to a less extent. 'INFUNDIN' is injected intramuscularly or intravenously.

INDICATIONS

TRADE 'INFUNDIN' MARK

'INFUNDIN' is used to contract the uterus in post-partum hæmorrhage; to raise the blood-pressure in surgical shock; to initiate peristalsis in intestinal paresis; in chronic hypotension; and in diabetes insipidus.

TRADE 'NEO-INFUNDIN' MARK

By methods of fractionation a separation of the oxytocic principle almost free from the pressor constituent may be accomplished. This oxytocic principle is issued as 'NEO-INFUNDIN' for obstetrical use.

'NEO-INFUNDIN' has the same indications in labour as 'Infundin,' but the absence of the pressor principle precludes the occurrence of the vasomotor phenomenon known as "pituitary shock." The absence of the pressor principle also makes 'NEO-INFUNDIN' desirable in those obstetrical cases with raised blood-pressure (toxæmias of pregnancy and eclampsia).

'NEO-INFUNDIN' is standardised to contain the same oxytocic potency as 'Infundin' and is used in the same obstetrical doses ante-partum and post-partum.

OBSTETRICAL USE OF 'INFUNDIN' AND 'NEO-INFUNDIN'

Ante-Partum

'INFUNDIN' or 'NEO-INFUNDIN' has a limited and specialised ante-partum indication, namely, in cases of definite uterine inertia *with which malpresentation or other mechanical obstruction to delivery can with certainty be stated to be absent*. A dose of two units of 'INFUNDIN' or 'NEO-INFUNDIN,' by intramuscular injection, in such cases may be expected to produce an effect which should be useful in hastening the course of the labour, *provided that it is not administered before the os is about one-half dilated*.

Precautions in
ante-partum
administration

A dose of two units of 'INFUNDIN' or 'NEO-INFUNDIN' may be given with safety at any stage, *provided there is no mechanical obstruction*. The least interval at which any dose can be usefully repeated is one hour, but often the effect of two units lasts longer than this. A dose of two units produces, in some patients, a striking increase in uterine action. Two units of 'INFUNDIN' or 'NEO-INFUNDIN' produce a valuable acceleration of a labour sluggish owing to uterine inertia, and, with the precautions mentioned, this dose may obviate, in some cases, the need of applying forceps.

Post-Partum

After labour, when the uterus is empty, the use of 'INFUNDIN' or 'NEO-INFUNDIN' is not accompanied by the kind of risk which existed previously, and the dosage may be large. The indication for the post-partum use of 'INFUNDIN' or 'NEO-INFUNDIN' is the emergency of sudden

severe hæmorrhage. 'INFUNDIN' or 'NEO-INFUNDIN' may be given intramuscularly in a dose of 10 to 15 units. The strong uterine action which is brought about immediately leads to a diminution of the hæmorrhage. The effect passes off, however, in a relatively short time, and so, in addition, a full dose of 'ERNUTIN' should be given intramuscularly to maintain a tonic contraction of the uterus. This supplementary use of 'INFUNDIN' or 'NEO-INFUNDIN' and 'ERNUTIN' is very effective in the emergency of post-partum hæmorrhage.

'ERNUTIN' is a clear solution presenting ergotoxine—the specific active principle of ergot—together with 'Ergamine' and 'Tyramine'—in definite amount and in a state of chemical purity. It may be administered orally or by injection (*see Wellcome's Medical Diary*)

'INFUNDIN' IN SURGICAL SHOCK

Surgical shock may be considered to be due to the liberation of histamine (or allied substance) from the damaged area into the general blood-stream. This causes a dilatation of capillaries and an abnormal distribution of the blood. The venous return to the heart is interfered with and the heart's output considerably decreased. *In this condition posterior pituitary extract is injected in order to re-establish capillary tone*, but the injection must be intramuscular or intravenous, otherwise no systemic action on the capillaries is brought about; subcutaneous injections are ineffective. A dose of 20 units of 'HYPOLOID' 'INFUNDIN' should be injected intramuscularly with the object of affecting

capillary tone and causing general capillary contraction with a more normal distribution of blood and increase of blood-pressure. A more effective measure would be to inject 10 units of 'HYPOLOID' 'INFUNDIN' in one pint of normal saline intravenously.

OTHER INDICATIONS FOR 'INFUNDIN'

In post-operative atony and intestinal paresis, an intramuscular injection of 'INFUNDIN' initiates peristalsis in many cases and affords prompt relief. The efficiency of enemata in cases of intestinal paresis is increased if an intramuscular injection of 'INFUNDIN' has been given half-an-hour previously.

In post-partum and post-operative retention of urine, 'INFUNDIN' has been found to re-establish the flow.

In certain cases of persistent low blood-pressure, a course of intramuscular injections of 'INFUNDIN' may be found valuable. 'INFUNDIN' may be injected intramuscularly in doses of 0.5 c.c. (*Original Strength*) daily (or two or three times a week), gradually increased, if necessary, up to 1 c.c. or 2 c.c. until intolerance is indicated by the onset of diarrhoea, when the dose must be gradually decreased.

'INFUNDIN' is used in the treatment of diabetes insipidus to replace the hypophyseal deficiency.

Preparations

TRADE MARK 'HYPOLOID' BRAND 'INFUNDIN' TRADE MARK PITUITARY
(POSTERIOR LOBE) EXTRACT (*Original Strength*,
10 International Units per c.c.), 0.5 c.c. and 1 c.c.

[SEE B. W. & Co.]

DIRECTION.—Half to one c.c., injected intramuscularly, or it may be given intravenously or per rectum in normal saline. *Obstetrical*—Ante-partum, 2 units; post-partum, 10 to 15 units; in both cases by intramuscular injection.

Boxes of 6 hermetically-sealed containers

TRADE MARK 'HYPOLOID' BRAND 'INFUNDIN' TRADE MARK PITUITARY
(POSTERIOR LOBE) EXTRACT (5 International Units
per c.c.), 0.5 c.c. and 1 c.c. [SEE B. W. & Co.]

DIRECTION.—One to two c.c., injected intramuscularly, or it may be
given intravenously or per rectum in normal saline. *Obstetrical*—
Ante-partum, 2 units; post-partum, 10 to 15 units; in both cases
by intramuscular injection.

Boxes of 6 hermetically-sealed containers
NOTE.—'INFUNDIN' (*Original Strength*) is always supplied
unless the lower potency is specified.

TRADE MARK 'HYPOLOID' BRAND 'NEO-INFUNDIN' TRADE MARK
Oxytocic Principle of the Pituitary Posterior Lobe
(10 International Units per c.c.), 0.5 c.c. and 1 c.c.

[SEE B. W. & Co.]
DIRECTION.—Ante-partum, 2 units; post-partum, 10 to 15 units, in
both cases by intramuscular injection.

Boxes of 6 hermetically-sealed containers

LIVER EXTRACT

'WELLCOME' BRAND LIVER EXTRACT is
prepared by a method found efficient by the Medical
Research Council after the substance had been
subjected to clinical tests. It is a light brown
powder and represents an active selected fraction
of an extract of fresh liver.

'WELLCOME' BRAND LIVER EXTRACT, admin-
istered daily in pernicious anæmia, produces rapid
progressive increase of the red blood cells to normal,
with disappearance of the symptoms of the disease.

Below are given the data concerning a typical
case of pernicious anæmia successfully treated by
'WELLCOME' BRAND LIVER EXTRACT.

Third attack. 'WELLCOME' LIVER EXTRACT,
contents of two tubes daily, started January 13.

DATE	R.B.C.'s	Hb.	Reticulocytes
Jan. 11	1,100,000	26 per cent.	0.5 per cent.
„ 20	1,060,000	24 „	4.0 „
„ 21	—	—	9.0 „
„ 24	1,470,000	35 per cent.	8.0 „
„ 28	1,620,000	40 „	0.5 „
Feb. 7	2,400,000	62 „	0.5 „
„ 28	4,040,000	85 „	0.5 „

Secondary Anæmia

Liver treatment is also valuable in initiating and accelerating a regeneration of red blood cells in those cases of secondary anæmia which are due to hæmorrhage, *e.g.*, hæmatemesis or post-partum hæmorrhage. The regeneration effect is enhanced by the concurrent administration of iron. Liver therapy does not seem to be of specific use in secondary anæmias due to causes other than hæmorrhage or in aplastic anæmia and other blood diseases.

Liver Dysfunction

There are indications that liver therapy is valuable in certain conditions due to liver poisoning and dysfunction. Cases of dermatitis due to arseno-benzene idiosyncrasy have been remarkably benefited. Liver therapy has also been found to be a valuable aid in certain cases in the treatment of the vomiting of pregnancy and pre-eclamptic conditions.

Sprue

Anæmia of sprue, when of the severe "pernicious" type, reacts to liver therapy with a reticulocytosis and regeneration of red cells, as in pernicious anæmia.

Preparation

TRADE MARK 'WELLCOME' BRAND LIVER EXTRACT [J&F B. W. & Co.]

Tubes, each containing an active selected fraction of an extract derived from half-a-pound of fresh liver.

DIRECTION—The contents of one tube or more, daily. 'Wellcome' Liver Extract may be taken in soup or water.

Boxes of 12 tubes

ADRENALIN

Adrenalin is the crystalline active principle of the medulla of the suprarenal gland.

'WELLCOME' BRAND ADRENALIN not only conforms to the characters and tests of the B.P. but also to the more stringent requirements of the 'Wellcome' Brand standard.

INDICATIONS

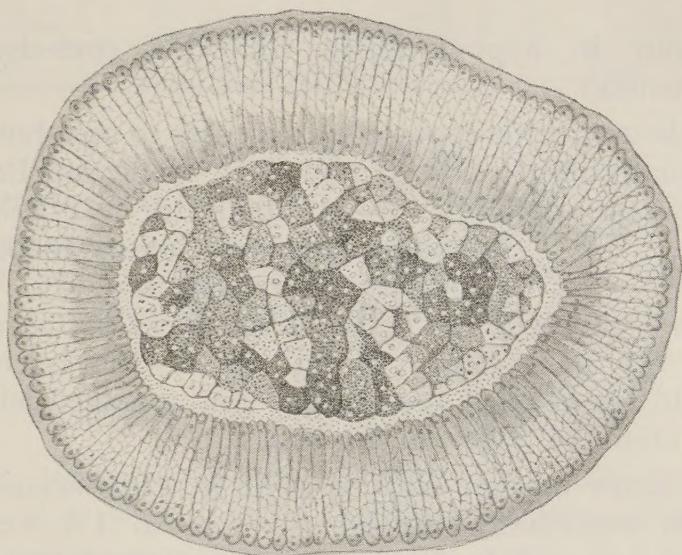
Adrenalin is not absorbed by the intact skin, but, applied to mucous membranes, there is a local blanching and ischæmia, due to contraction of superficial arterioles and capillaries.

Added to local anæsthetic solutions, Adrenalin enhances the effect by constricting the vessels and preventing absorption. For permeation anæsthesia, a 1 in 1000 solution is added in equal quantity to the anæsthetic solution. For infiltration anæsthesia, by injection, 5 minims of Adrenalin Solution (1 in 1000) should be added to each drachm of anæsthetic solution. In dental practice, it is added to the anæsthetic solution in the proportion of from 1 in 10,000 to 1 in 5000.

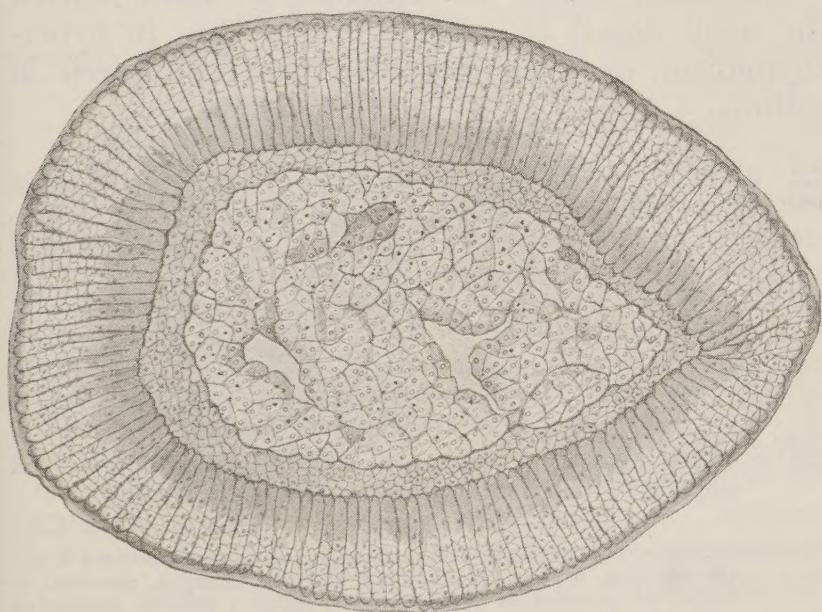
Adrenalin is, in some cases, invaluable, applied in 1 in 5000 solution, for control of bleeding in nasal surgery, or to ensure a bloodless field in operations on the eye. Epistaxis is controlled by a plug soaked in 1 in 1000 solution, as also local capillary hæmorrhage or bleeding from small arterial twigs in accessible parts, such as tooth sockets. In hæmatemesis, $\frac{1}{2}$ to 1 ounce of 1 in 1000 solution may be useful, given orally, especially after lavage.

Adrenalin is of value in 1 in 10,000 to 1 in 5000 solution, applied as a spray in acute coryza, hay fever and congestive conditions of the nasal mucous membrane. In acute œdema of the pharynx or larynx, a spray of similar strength (with or without 5 to 10 per cent. cocaine) considerably reduces the swelling. Cases of tonsillitis are similarly greatly relieved. Too frequent spraying should be avoided.

Adrenalin solution (1 in 1000), $\frac{1}{2}$ c.c. to 1 c.c., injected intramuscularly, effectively combats anaphylactic shock and the undesirable effects which sometimes follow the injection of serum; similar dosage is particularly effective in the vaso-motor disturbances following arsenobenzene injections; also valuable in the same dosage as an emergency



Section of suprarenal gland of a normal mouse fixed in osmic vapour. The medulla and cortex are separated by the narrow zona reticularis. The medullary cells are filled with fine granules of adrenalin stained black.



Section of suprarenal gland of a mouse which has been exercised and exposed to cold. The medullary cells are exhausted of adrenalin, as shown by the absence of the fine granules present above.

measure in hypoglycæmia following over-dosage of insulin.

It is used with conspicuous success to cut short an asthmatic attack; 5 to 10 minims of 'Wellcome' Brand Adrenalin Solution (1 in 1000), or 'Hypoloid'

Asthma Adrenalin, injected subcutaneously, or, preferably, intramuscularly, will, by its broncho-dilator action, in most cases, promptly stop the paroxysm. Repetition of the injection should be avoided if possible—not repeated within two hours or twice in 24 hours.

In acute cardiac failure, or in syncope occurring as an anæsthesia accident, 1 c.c. to 1.5 c.c. of 1 in 1000 solution, injected into the **Cardiac failure** heart-wall or into the cavity, often re-establishes cardiac contraction; similar dosage, intravenously, may be given in sudden circulatory failure during infections.

Adrenalin should be administered *with caution* (in small doses) in cardiac disease and in hyperthyroidism, or when morphine has been given in asthma.

Preparations

TRADE MARK 'WELLCOME' BRAND SOLUTION OF ADRENALIN, 1 in 1000, in bottles of 10 c.c. and 25 c.c. [SEE LIST B. W. & Co.]

DIRECTION.—For strengths used, *see above*.

TRADE MARK 'HYPOLOID' BRAND ADRENALIN, in 1 c.c. 1 in 1000 solution [SEE LIST B. W. & Co.]

DIRECTIONS.—For *Intravenous Injection*—One c.c. in 500 c.c. of normal saline. For *Hypodermic Injection*—5 to 15 minims.

Boxes of 10 hermetically-sealed containers

TRADE MARK 'SOLOID' BRAND ADRENALIN, 0.0012 gramme (gr. 1/54 approx.); and 0.005 gramme (gr. 1/13 approx.) [SEE LIST B. W. & Co.]

DIRECTION.—One of the 0.0012 gramme strength, dissolved in 1.2 c.c. (20 minims), or one of the 0.005 gramme strength, dissolved in 5 c.c. (84 minims), of distilled water, forms a solution containing one part of Adrenalin in 1000.

Solutions of 1 in 100,000 to 1 in 1000 are employed for general use.

Each strength in tubes of 6

(For other preparations of Adrenalin, *see Wellcome's Medical Diary*)



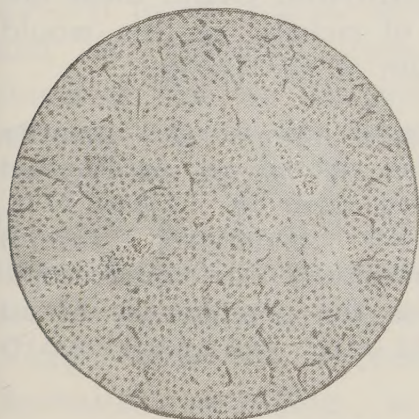
CHAPTER 2

PARATHYROID GLAND ... 27	SUPRARENAL (WHOLE GLAND) ... 30
PITUITARY (WHOLE GLAND) ... 29	OVARIAN SUBSTANCE ... 30
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PARATHYROID GLAND

THE hormone of the parathyroid gland controls the calcium content of the blood-plasma, which is maintained at a constant level of about 10 mg. per 100 c.c., with little variation in health. Extirpation of the parathyroid results in a markedly lowered blood-calcium with the onset of tetany; administration of the gland ^{Blood calcium} supplies the missing hormone and raises the blood-calcium to normal (or above, if dosage is large or persistent). The hormone does

not affect absorption of calcium from the alimentary canal, but raises the blood-calcium by mobilising calcium from the bones.



Section of
PARATHYROID GLAND

Compare with
THYROID, page 7

Liquid extracts of the gland may be given subcutaneously in emergency, but administration must be cautious, as serious toxic symptoms arise if the blood-calcium becomes persistently

raised to a high level. Collip got clear results from gland tissue given by the mouth, but only when fresh

tissue was used. Some clinicians have expressed their belief in the activity of the dried gland when administered by the mouth because administration was followed by toxic symptoms. Whilst it cannot yet be said to be proved that the hormone in the form usually available is absorbed when given by the mouth, in default of fresh tissue, there are available for the physician preparations of the dried gland.

INDICATIONS

Parathyroid Gland is given to raise the blood-calcium level when this is below normal in Raynaud's disease, urticaria, eczema and prurigo; also in angio-neurotic oedema, and hay fever. It is indicated in other states of lowered blood-calcium associated with tetany or with muscular irritability. A calcium salt is usually given conjointly with parathyroid to ensure that dietary calcium is sufficient for metabolic purposes. For this purpose, 'TABLOID' PARATHYROID GLAND AND CALCIUM LACTATE is issued. Parathyroid Gland must not be given in the tetany of rickets, as this would further deplete the calcium of the bones.

In view of the uncertainty as to the identity of the material sometimes offered as parathyroid gland, the gland substance used in 'TABLOID' PARATHYROID GLAND undergoes careful inspection, checked periodically by microscopic sections. By these means the genuineness of all material used in 'TABLOID' PARATHYROID GLAND is ensured.

Preparations

TRADE MARK 'TABLOID' BRAND PARATHYROID GLAND, gr. $\frac{2}{5}$ (0.026 gm.) [equivalent to gr. $\frac{1}{10}$ (0.0065 gm.) of desiccated gland] [JSF B. W. & Co.]

DIRECTION.—One to two, taken with a little water, twice or thrice daily, half-an-hour before meals.

Bottles of 25 and 100

TRADE MARK 'TABLOID' BRAND PARATHYROID GLAND AND CALCIUM LACTATE [SEE LIST B. W. & Co.]

R Glandulæ Parathyroideæ, gr. 1/10 (0.0065 gm.)
(Equivalent to gr. 1/40 [0.0016 gm.]
of desiccated gland)

Calcii Lactatis, gr. 5 (0.324 gm.)

DIRECTION.—One to three, taken with a large wineglassful of water, three or four times daily, *one hour before meals*.

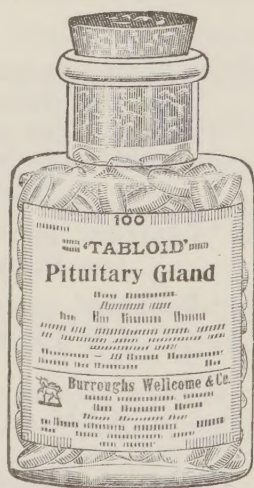
Bottles of 25 and 100

PITUITARY (WHOLE GLAND)

Pituitary Gland (Whole Gland) has been used in states of hyposecretion of the anterior lobe (dystrophia adiposo genitalis, later stages of acromegaly, infantilism and, with thyroid, in backward development in children).

Pituitary Gland (Whole Gland) is valuable (for the pressor action of the posterior lobe) in chronic arterial hypotension. The pressor principle is not affected by the gastric secretions and is absorbed from the stomach, but is destroyed on entering the small intestine.

'TABLOID' BRAND PITUITARY GLAND, gr. 4, may be given three or four times a day, for several weeks or months. The dosage must be increased or decreased according to the tolerance of the patient, head-throbbing, palpitation and general discomfort indicating a too high dosage. It is also indicated to replace the hypophyseal deficiency in diabetes insipidus.



Reduced facsimile

Preparations

TRADE MARK 'TABLOID' BRAND PITUITARY GLAND, gr. 2 (0.13 gm.);
and 0.15 gramme* [B. W. & Co.]

DIRECTION.—One to two, of either strength, gradually increased if necessary, three or four times daily, preferably after food.

Each strength in bottles of 100

TRADE MARK 'TABLOID' BRAND THREE GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

TRADE MARK 'TABLOID' BRAND MIXED GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

SUPRARENAL (WHOLE GLAND)

Improvement sometimes follows large doses of suprarenal gland substance in Addison's syndrome. In various forms of autonomic imbalance, or in Graves' syndrome, and in hyperthyroidism, persistent administration often relieves symptoms. It has been found useful in conditions dependent upon hypoadrenia, such as certain forms of depression and melancholia, and after influenza and other acute infections, especially diphtheria.

Preparations

TRADE MARK 'TABLOID' BRAND SUPRARENAL GLAND, gr. 5 (0.324 gm.);
and 0.3 gramme* [B. W. & Co.]

DIRECTION.—One, of either strength, gradually increased, taken with a little water, when stomach is empty, twice or thrice daily.

Each strength in bottles of 100

TRADE MARK 'TABLOID' BRAND THREE GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

TRADE MARK 'TABLOID' BRAND MIXED GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

OVARY ('VARIUM')

(Trade Mark)

Ovarian substance has been used to relieve the symptoms of the post-operative or natural menopause; in irregular or delayed menstruation at

* Obtainable in the British Empire Overseas to special order only

puberty; in obesity associated with amenorrhœa; and in pruritus vulvæ or kraurosis occurring at or after the menopause. The concurrent administration of thyroid gland may increase the effect.

Preparations

TRADE MARK 'TABLOID' BRAND 'VARIUM' TRADE MARK (formerly known as 'Tabloid' Ovarian Substance), gr. 5 (0.324 gm.); and 0.3 gramme* [SEE B. W. & Co.]

Each product represents the stated weight of fresh ovarian substance.

DIRECTION.—One or two, of either strength, gradually increased to four or five, twice or thrice daily, preferably after food.

Each strength in bottles of 100

TRADE MARK 'TABLOID' BRAND MIXED GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

TESTIS (DIDYMIN)

(Orchitic Substance)

Testicular substance is stated to delay the involution processes of old age, and has been used in premature senility, impotence, sexual neuroses and enlarged prostate; the action appears to apply equally to the female, as return of the menses sometimes occurs after giving testicular substance, and in some cases symptoms of the menopause are relieved.

Preparations

TRADE MARK 'TABLOID' BRAND DIDYMIN, gr. 5 (0.324 gm.); and 0.3 gramme* [SEE B. W. & Co.]

Each product represents the stated weight of testicular substance.

DIRECTION.—One, of either strength, gradually increased to four, may be given three or four times daily, preferably after food.

Each strength in bottles of 100

TRADE MARK 'TABLOID' BRAND MIXED GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

* Obtainable in the British Empire Overseas to special order only



CHAPTER 3

THYMUS	32	MAMMARY	33
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PROSTATE	32	KIDNEY	34
LYMPHATIC	33	CEREBRAL SUBSTANCE ...	34
SPINAL CORD	34		

THYMUS

THYMUS GLAND has been used in delayed development in children (conjointly with thyroid) and is stated to be valuable in hyperthyroidism and Graves' syndrome (conjointly with suprarenal gland substance).

Preparations

TRADE MARK 'TABLOID' BRAND THYMUS GLAND, gr. 5 (0.324 gm.); and 0.3 gramme* [B. W. & Co.]

DIRECTION.—One, of either strength, gradually increased to five, may be given thrice daily, preferably after food.

Each strength in bottles of 100

TRADE MARK 'TABLOID' BRAND MIXED GLANDS

(see PLURI-GLANDULAR PREPARATIONS, page 36)

SPLEEN

Spleen substance has a hæmatinic action, increasing red cells and hæmoglobin, especially when combined with bone marrow. It is used in secondary anæmia and malnutrition; it has been given after splenectomy and in splenomegaly.

Preparation

TRADE MARK 'TABLOID' BRAND SPLEEN SUBSTANCE, gr. 5 (0.324 gm.) [B. W. & Co.]

DIRECTION.—One, gradually increased to four, three or four times daily, preferably after food.

Bottles of 100

PROSTATE

Prostate Gland has been used in enlarged prostate and after prostatectomy; also conjointly with Didymin.

Preparation

TRADE MARK 'TABLOID' BRAND PROSTATE GLAND, gr. 2-1/2 (0.162 gm.) [B. W. & Co.]

DIRECTION.—One to four, gradually increased, twice or thrice daily, preferably after food.

Bottles of 100

* Obtainable in the British Empire Overseas to special order only

LYMPHATIC GLAND

Lymphatic Gland has been used in the treatment of enlarged tonsils and adenoids.

Preparation

TRADE MARK 'TABLOID' BRAND LYMPHATIC GLAND,
gr. 5 (0.324 gm.) [SEE B. W. & Co.]

DIRECTION.—One, three times daily.

Bottles of 100

MAMMARY SUBSTANCE

Mammary Gland substance is stated to increase uterine tone, and has been suggested to assist involution of the uterus after labour, and in menorrhagia. It is a reputed antagonist of ovarian secretion and may thus be found useful in dysmenorrhoea and menorrhagia in adolescents.

Preparations

TRADE MARK 'TABLOID' BRAND 'MAMOS' TRADE MARK gr. 5 (0.324 gm.); and
0.3 gramme* [SEE B. W. & Co.]

DIRECTION.—One, of either strength, gradually increased, three or four times daily, preferably after food.

Each strength in bottles of 100

TRADE MARK 'TABLOID' BRAND MIXED GLANDS (see PLURI-
GLANDULAR PREPARATIONS, page 36)

BONE MEDULLA

Bone Medulla is used in anæmia (see also SPLEEN SUBSTANCE, page 32).

Preparations

TRADE MARK 'TABLOID' BRAND BONE MEDULLA, gr. 5 (0.324 gm.)
(Capsule) [SEE B. W. & Co.]

DIRECTION.—One, or more, taken with a little water, after food.

Boxes of 50

TRADE MARK 'VALULE' BRAND BONE MEDULLA (Flexible Capsule)
[SEE B. W. & Co.]

Each represents gr. 5 (0.324 gm.) of fresh substance.

DIRECTION.—One, or more, taken with a little water, after food.

Bottles of 100

* Obtainable in the British Empire Overseas to special order only

RENAL SUBSTANCE

Kidney Substance has been used in nephritis and chronic Bright's disease.

Preparation

TRADE MARK 'TABLOID' BRAND KIDNEY SUBSTANCE,
gr. 5 (0.324 gm.) [^{SEE LIST} B. W. & Co.]

DIRECTION.—One to three, three times daily, after food.

Bottles of 100

CEREBRAL SUBSTANCE

Cerebral Substance (Cerebrin) has been used in certain mental conditions.

Preparations

TRADE MARK 'TABLOID' BRAND CEREBRIN, gr. 5 (0.324 gm.)
[^{SEE LIST} B. W. & Co.]

Each product represents the stated weight of cerebral substance.

DIRECTION.—One, gradually increased, three or four times daily, preferably after food.

Bottles of 100

TRADE MARK 'TABLOID' BRAND MIXED GLANDS
(see PLURI-GLANDULAR PREPARATIONS, page 36)

SPINAL CORD

Spinal Cord Substance is used conjointly with cerebral substance.

Preparation

TRADE MARK 'TABLOID' BRAND SPINAL CORD SUBSTANCE,
gr. 2-1/2 (0.162 gm.) [^{SEE LIST} B. W. & Co.]

DIRECTION.—One, or more, three or four times daily.

Bottles of 100



CHAPTER 4

PLURI-GLANDULAR PREPARATIONS

THE interdependence of the various endocrine glands and the balance which seems to exist in the functional activities of certain groups has the result that irregular function of one unit is followed by a disturbance of others. Although changes in the function of a single gland may instigate a disturbance, yet other endocrine glands, by their reciprocal action, may sometimes contribute very greatly to the clinical picture. Such imbalance suggests a pluri-glandular therapy.

INDICATIONS

‘TABLOID’ BRAND THREE GLANDS is indicated in cretinism, backwardness in children and other conditions of hypothyroidism.



Reduced facsimile

‘TABLOID’ BRAND MIXED GLANDS, No. 1 (*Male*), is indicated in hypotonic and neurasthenic conditions, premature senile changes and hypochondriasis. It may also be found particularly effective in the female.

‘TABLOID’ BRAND MIXED GLANDS, No. 2 (*Female*), is indicated in the same conditions as No. 1 (*Male*), and in amenorrhœa and at the menopause.

Preparations

TRADE MARK 'TABLOID' BRAND THREE GLANDS [BEE B. W. & Co.]

R	Glandulæ Thyroideæ,	gr. 6	(0.389 gm.)
	Glandulæ Suprarenalis,	gr. 3/4	(0.049 gm.)
	Glandulæ Pituitariæ,	gr. 1/16	(0.004 gm.)

DIRECTION.—One, or more, taken with a little water.

Bottles of 100

TRADE MARK 'TABLOID' BRAND MIXED GLANDS [BEE B. W. & Co.]

No. 1 (MALE)

R	Glandulæ Thymicæ,	gr. 2	(0.13 gm.)
	Glandulæ Thyroideæ,	gr. 1/5	(0.013 gm.)
	Glandulæ Pituitariæ (Lobuli Anterioris),	gr. 1/2	(0.032 gm.)
	Glandulæ Suprarenalis,	gr. 1/4	(0.016 gm.)
	Didymin (<i>Orchitic Substance</i>),	gr. 1/2	(0.032 gm.)
	Cerebrini,	gr. 1/2	(0.032 gm.)

No. 2 (FEMALE)

R	Glandulæ Thymicæ,	gr. 2	(0.13 gm.)
	Glandulæ Thyroideæ,	gr. 1/5	(0.013 gm.)
	Glandulæ Pituitariæ (Lobuli Anterioris),	gr. 1/2	(0.032 gm.)
	Glandulæ Suprarenalis,	gr. 1/4	(0.016 gm.)
	'Varium' (<i>Ovarian Substance</i>),	gr. 1/2	(0.032 gm.)
	'Mamos' (<i>Mammary Gland</i>),	gr. 1/2	(0.032 gm.)
	Cerebrini,	gr. 1/2	(0.032 gm.)

DIRECTION.—One, of the appropriate product, gradually increased, taken with a little water, thrice daily.

Each in bottles of 100

NOTE.—The words 'TABLOID,' 'INFUNDIN,' 'NEO-INFUNDIN,' 'ERNUTIN,' 'HYPOLOID,' 'MAMOS,' 'VALULE,' 'VARIUM' and 'WELLCOME' are trade marks or brands



BURROUGHS WELLCOME & CO., LONDON (ENG.)

THE WELLCOME FOUNDATION LTD.

[GOVERNING DIRECTOR—HENRY S. WELLCOME DEPUTY-GOVERNING DIRECTOR—GEO. E. PEARSON]
(BRITISH—FORMERLY U.S.A.)*Associated Houses:*

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SURFACE MARKINGS, No. III

THE ABDOMEN

SURFACE LINES.—*Transpyloric Plane, or Pyloric Line.*—Horizontal plane midway between upper border of sternum and crest of pubes, and midway between ensiform cartilage and navel. In normal parts it is also a line joining tips of ninth costal cartilages.

It is on a level with the following:—Pylorus—first part of the duodenum. Gall-bladder. Duodenojejunal junction. Hila of kidneys—beginning of ureters. Body of pancreas. Lower border of first lumbar vertebra.

Line of Iliac Crests.—Level with fourth lumbar vertebra.

Intertubercular Plane.—Through the tubercles on outer lips of the iliac crests. Level with fifth lumbar vertebra.

Mid-Poupart Line.—Vertical line drawn through mid-point of Poupart's ligament.

Internal Abdominal Ring.—Just above middle of Poupart's ligament.

External Abdominal Ring.—Just above the pubic crest.

LIVER.—*Behind*—Eighth interspace in left scapular line, to eighth dorsal spine, to eighth rib in right scapular line. *Below, in front*—Left fifth interspace in mid-clavicular line, to transpyloric plane in mid-line, to right costal margin. *Above, in front*—Left fifth interspace in mid-clavicular line, to junction between sternum and ensiform cartilage, to fifth rib in the right mid-clavicular line.

STOMACH.—*Cardiac Orifice*—1 in. to left of junction of ensiform cartilage. *Highest Level*—Fifth interspace in left mid-clavicular line. *Pyloric Orifice*—1 in. to right of middle of transpyloric line. *Lowest Level*—Infracostal line.

DUODENUM.—1 in. to right of middle of transpyloric line, ends 1 in. to left of, and a little below, middle of transpyloric line. Extends to the right as far as right mid-Poupart line, and below as far as line joining highest points of the iliac crests.

APPENDIX.—Attached end, midway along horizontal line between right anterior superior iliac spine and mid-line.

GALL-BLADDER.—Angle where ninth right costal cartilage is crossed by outer border of right rectus.

PANCREAS.—*Body* lies on first lumbar vertebra, level of transpyloric line and of twelfth dorsal spine. *Tail* from twelfth dorsal spine to the left, up to the tenth rib above pyloric line. *Head* lies below pyloric line level with second lumbar vertebra.

SPLEEN underlies ninth, tenth and eleventh ribs on left side, Innermost point, $1\frac{1}{2}$ in. from tenth dorsal spine. Outermost point, left mid-axillary line.

KIDNEYS.—*Behind*—Level of eleventh dorsal spine to that of third lumbar spine. Hilum 2 in. from first lumbar spine. Inner border 2 in. from mid-line, outer border 4 in. from mid-line. *In Front*—Hilum on transpyloric line 2 in. from tip of the ninth costal cartilage. Thence kidney extends upwards to sixth costal cartilage on the left and to seventh on the right. Outwards 2 in. Downwards to the infracostal plane on the left, and below this on the right. In each case the upper pole is $\frac{1}{2}$ in. nearer the mid-line than the lower. Left kidney is $\frac{1}{2}$ in. higher than right. *Suprarenal Capsule*—Opposite inner part of eleventh intercostal space. *Ureter*—From hilum to posterior superior iliac spine behind. From hilum to bifurcation of iliac arteries in front.